# PATENT COOPERATION TREATY

# **PCT**

# TRANSLATION INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference  HHP-5862-WO				FOR FURTHER ACT	ION	See Form PCT/IPEA/416				
International application No.				International filing date (	day/month/year)	Priority date (day/month/year)				
PCT	/EP2	2004/0	14078	10.12.2004		10.12.2003				
International Patent Classification (IPC) or national classification and IPC H01S3/115										
Applicant HIGH Q LASER PRODUCTION GMBH										
1.	1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.									
2.	This R	EPORT cons	sists of a total of	5	sheets, includin	g this cover sheet.				
3.	This re	eport is also a	accompanied by Al	NNEXES, comprising:						
	a. 🔀	(sent to	the applicant and	to the International Burea	u) a total of 3	sheets, as follows:				
	sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).									
	sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.									
	ъ. [	7		Bureau only) a total of (inc	licate type and numbe	er of electronic carrier(s))				
	_	<b>-</b> .			• •					
	, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).									
4.	This re	eport contains	s indications relati	ng to the following items:						
	$\boxtimes$	Box No. I	Basis of the	report						
	$\sqcup$	Box No. II	Priority							
		Box No. III	Non-establi	hment of opinion with regard to novelty, inventive step and industrial applicability						
		Box No. IV	Lack of unit	ty of invention	of invention					
	$\boxtimes$	Box No. V		eatement under Article 35(2 d explanations supporting s		elty, inventive step or industrial applicability;				
		Box No. VI	Certain doc	uments cited						
Box No. VII Certain defects in the international				ects in the international app	lication					
	Box No. VIII Certain observations on the international application									
Date of submission of the demand			Da	te of completion of th	uis report					
Name and mailing address of the IPEA/EP				Au	Authorized officer					
Facsimile No.				Tel	ephone No.					

International application No.

PCT/EP2004/014078

Box	No. I	I Basis of the report		
1.		th regard to the language, this report is based on the internation	nal application in the language in	which it was filed, unless otherwise
		This report is based on translations from the original langua which is the language of a translation furnished for the purp international search (Rule 12.3 and 23.1(b))		,
		publication of the international application (Rule 12.4	)	
		international preliminary examination (Rule 55.2 and		
2.	rece	th regard to the <b>elements</b> of the international application, this eiving Office in response to an invitation under Article 14 are report):		
		the international application as originally filed/furnished		
	M	the description:		
		pages <b>1-16</b>		as originally filed/furnished
		pages*	received by this Authority on	
		pages*	received by this Authority on	
	$\boxtimes$	the claims:		
		nos.		as originally filed/furnished
		nos.*	as amended (togethe	r with any statement) under Article 19
		nos.* <u>1-11</u>	received by this Authority on	10.05.2005 with letter of 04.05.2005
		nos.*	received by this Authority on	
	$\boxtimes$	the drawings:		
		sheets 1/4-4/4		as originally filed/furnished
		sheets*	received by this Authority on	
		sheets*	received by this Authority on	
		a sequence listing and/or any related table(s) – see Supplem	nental Box Relating to Sequence L	isting.
3.	Ш	The amendments have resulted in the cancellation of:		
		the description, pages		
		the claims, nos.		
		the drawings, sheets/figs		
		the sequence listing (specify):		
		any table(s) related to sequence listing (specify):		
4.		This report has been established as if (some of) the amend they have been considered to go beyond the disclosure as fi		
		the description, pages		
		the claims, nos.		
		the drawings, sheets/figs		
		the sequence listing (specify):		_
		any table(s) related to sequence listing (specify):		
*	If ite	em 4 applies, some or all of those sheets may be marked "sup	erseded."	

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Вох		Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement				
1.	Statement					
	Novelty (N)	Claims	1-11	YES		
		Claims		_ NO		
	Inventive step (IS)	Claims	1-11	YES		
		Claims		_ NO		
	Industrial applicability (IA)		1-11	YES		
		Claims		_ NO		

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: US 5 848 080 A

D1: US 5 870 421 A

The subject matter of claim 1 is novel because neither document D1 nor document D2 discloses saturable absorber mirrors or mode locking. A laser having the features specified in claim 1 is not known from any of the other prior art documents.

The following features of claim 1 are known from the prior art:

High-repetition mode-locked ultrashort laser pulse system for generating femtosecond or picosecond pulses using the principle of pulse decoupling, having at least:

- one amplifying laser medium,
- one laser resonator with at least one resonator mirror and at least one pulse decoupling component;
- one saturable absorber mirror; and

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

 one pump source, more particularly a laser diode source, for pumping the laser medium.

The subject matter of claim 1 differs in that the pulse decoupling component is an electrooptical modulator.

The problem solved by this distinguishing feature is that of providing a compact laser system which uses the principle of pulse decoupling to emit ultrashort (high-energy) pulses.

None of the prior art documents disclose the combination of the above-mentioned features, nor do they provide any indication that these features could be used to solve the problem of interest. A person skilled in the art would not consider modifying the laser systems of D1 and D2 in order to solve the said problem. In particular, the gain medium in D1 is so large that the arrangement is not suitable as a solution to the problem of interest. The subject matter of claim 1 is therefore not only novel but also inventive.

Claims 2 to 11 refer directly or indirectly back to claim 1 and are therefore also novel and inventive.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The term "high-repetition" should have been clarified, as indicated in the applicant's letter of 4 May 2005 (page 2, third paragraph), by specifying the frequency ranges disclosed in the description (>10 kHz - page 4, lines 19 and 26).

The term "r-parameter" in claim 6 should have been clarified by stating equation 3, as disclosed on page 7 of the description. Currently the term "r-parameter" in claim 6 can only be understood in conjunction with the description, as it does not appear to be a clear and recognised term. The applicant is referred to the fifth paragraph on page 2 of the letter of 4 May 2005.